Science, Technology, and Innovation for America's National Security

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Office of Science and Technology Policy
The White House

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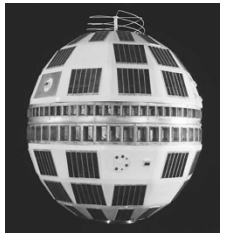
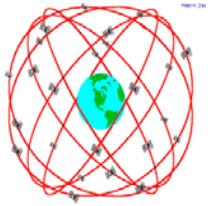
A Track Record of Critical Contributions

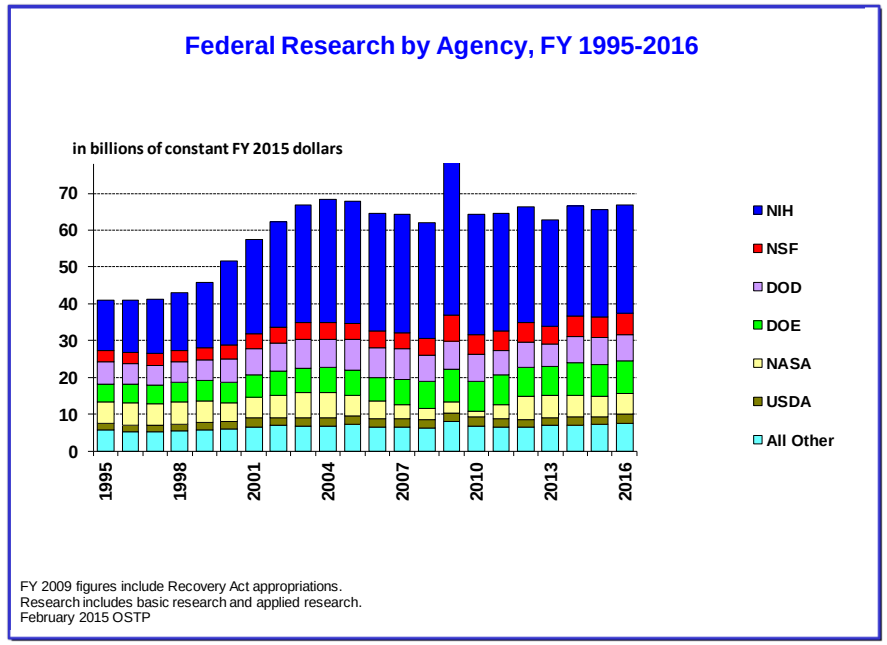






20th Century						21st
• Nuclear weapons • Radar • Proximity fuse • Sonar • Jet engine • LORAN	• Digital computer • ICBM • Transistor • Laser technology • Nuclear propulsion • Digital comm.	• Satellite comm. • Integrated circuits • Phased-array radar • Defense networks • Airborne surv. • MIRV	• Airborne GMTI/SAR • Stealth • Strategic CMs • IR search and track • Space track network • C2 networks	• GPS • UAVs • Night vision • Personal computing • Counter-stealth • BMD hit-to-kill	• Wideband networks • Web protocols • Precision munitions • Solid state radar • Advanced robotics • Speech recognition	• Nerve & Muscle interfaced artificial limbs • Armed UAVs • Optical SATCOM • Data mining • Advanced seekers • Decision support

Two major responsibilities for OSTP



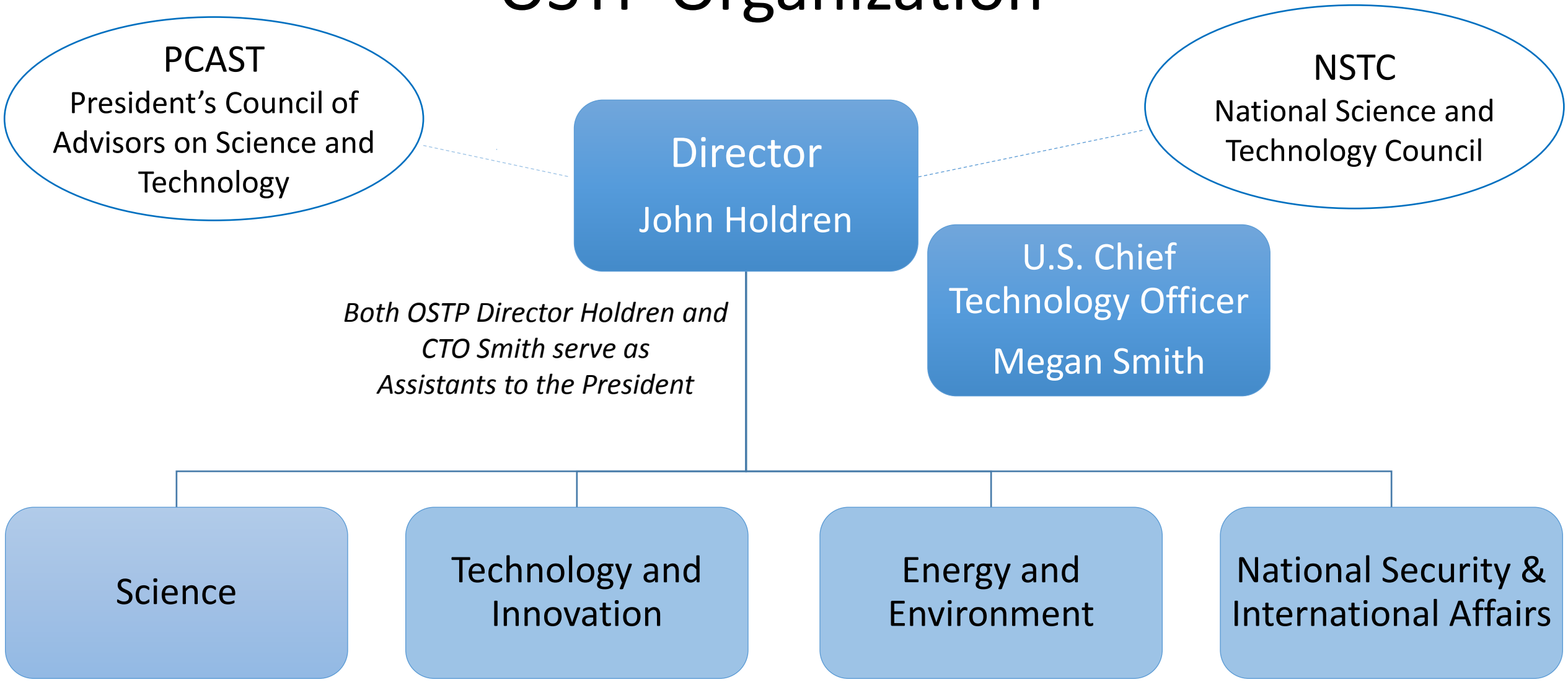
1. Policy for Science and Technology

- Analysis, recommendations, and coordination with other White House offices on R&D budgets and related policies
- Science and engineering education, and workforce issues
- Interagency S&T initiatives

2. Science and Technology for Policy

- Independent advice for the President about science and technology germane to all policy issues with which he is concerned

OSTP Organization



More than 100 staff, many on loan from agencies, labs, universities, and NGOs.

National Security and International Affairs Division

- Work with the National Security Council and other White House policy offices
- Lead and support cross-cutting, science and technology initiatives of import in the national security community, e.g Manufacturing, Precision Medicine, …
- Reform the national security science and technology enterprise via initiatives related to people, facilities, governance, and innovation.
- Facilitate Ministerial-level international science and technology engagement
  - Lead six joint commission meetings on S&T with China, (Russia), India, Brazil, Japan, South Korea
  - Meet with Science Ministers in other bi-lateral and multi-lateral fora
  - Lead the Innovation Dialogue with China
- Maintain situational awareness of enduring national security science and technology issues

FY2016 Budget: Investing in America's Future

- *Continues our commitment to world-class science and research*
- *Invests in innovation*
- *Improves Americans' health*
- *Makes America a magnet for jobs*
- *Invests in homegrown clean energy*
- *Takes action on climate change*
- *Prepares students with STEM skills*

- $68.8 billion for non-defense R&D.
- $76.9 billion for defense R&D.
- $66.9 billion for (basic and applied) research.
- $7.7 billion for the National Science Foundation (NSF).
- $5.3 billion for the Department of Energy (DOE) Office of Science.
- $755 million for the National Institute of Standards and Technology (NIST) laboratories.
- $18.5 billion for NASA to support the President's vision for: growing a robust U.S. commercial space industry; exploring the Solar System, including sending astronauts to an asteroid and Mars; developing innovative space technologies; and advancing understanding of the Earth.

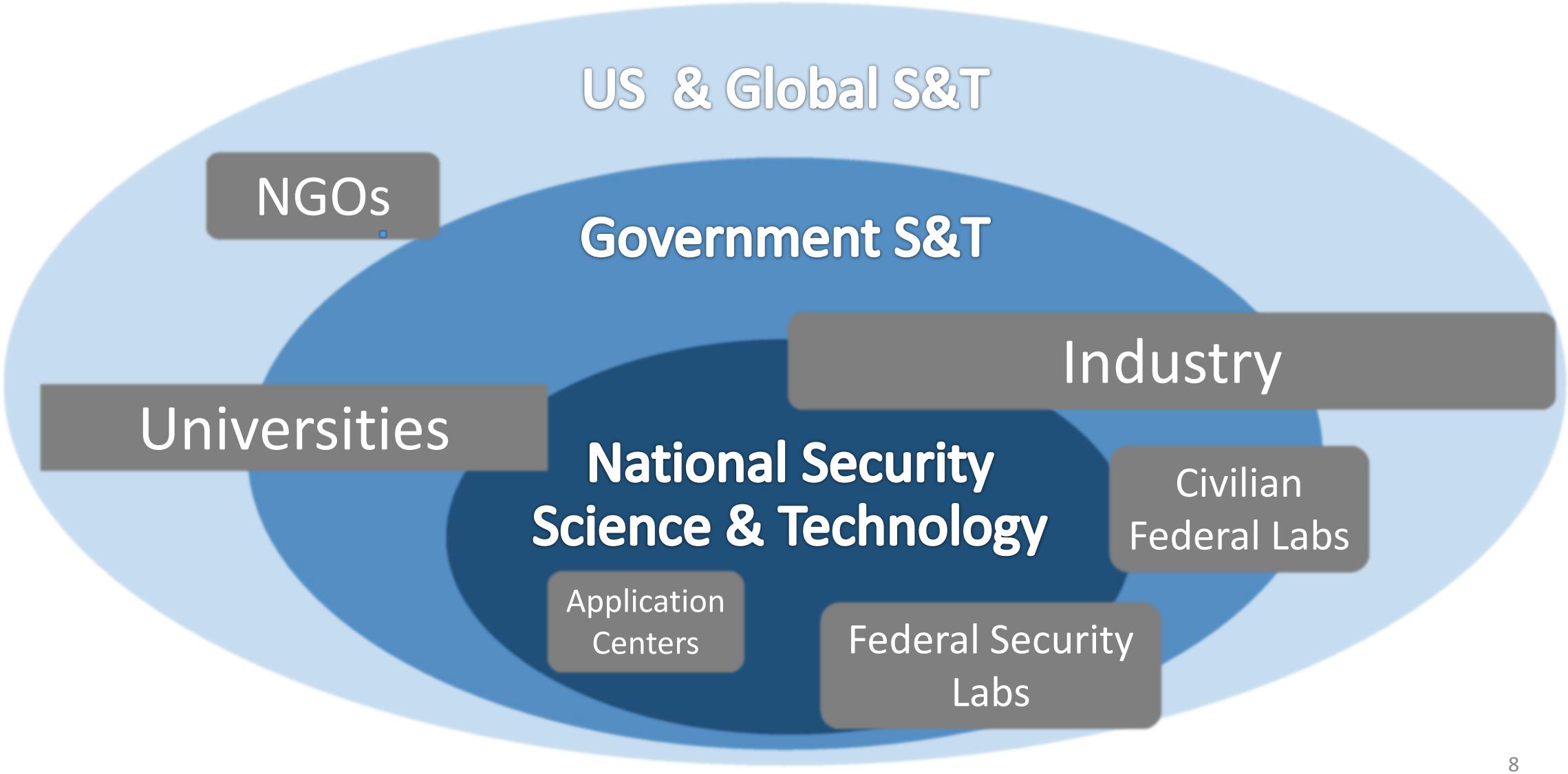
Investing in Innovation for National Security

"Twenty-first century businesses will rely on American science and technology, research and development."

- President Barack Obama
January 20, 2015

- $12.3 billion for DOD's Science & Technology (S&T) program of basic research, applied research, and advanced technology development.
- $3.0 billion for the Defense Advanced Research Projects Agency (DARPA) to maintain DOD's critical role in fostering breakthrough approaches for discovering promising technologies.
- A diverse portfolio, including advanced manufacturing, energy, cybersecurity, robotics, a safe and secure nuclear arsenal, explosives detection, and biodefense.
- $243 million for civilian R&D to support innovative cybersecurity technologies.

The National Security Science and Technology Enterprise



Challenges for the National Security S&T Enterprise

- Expanding Threats
  - Enduring threats for which the enterprise was designed
  - Novel and asymmetric threats that require alternate approaches
- A changed operational context
  - Increased global connectivity and access to technologies
  - Increased capabilities of individuals and sub-state groups
  - Offshoring of commercial manufacturing and R&D
  - Stability challenges – climate change, resource scarcity, pandemics, and natural disasters
- A fragile enterprise
  - Constrained budgets
  - Adverse workforce demographics
  - Aging facilities
  - Outdated processes and governance issues
  - Limited advocacy

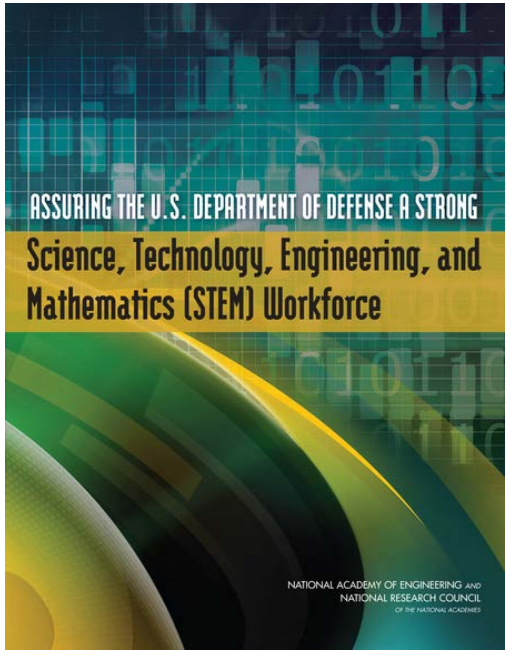
Nuclear Deterrence

Cybersecurity

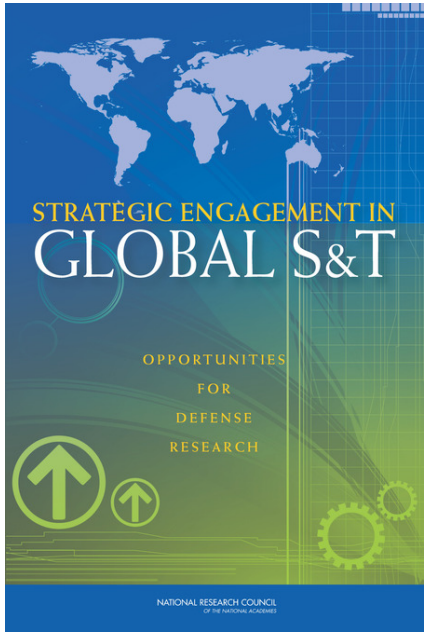
Strengthening the National Security STEM workforce

The National Academy of Engineering and the National Research Council recommend DOD:

- Be competitive with industry recruitment and retention policies
- Have access to the most talented STEM professionals globally
- Maintain critical capabilities through the use of unconventional programs such as “skunk works” and innovation cells, and by embracing a culture of prototyping.
- Have access to an agile, resilient STEM workforce that can be scaled rapidly to meet urgent threats.
- Provide continuing education and training opportunities to the civilian STEM workforce similar to those programs offered to career uniformed military personnel.



DOD and the Globalization of S&T



"If the DOD does not develop a specific, clearly defined and implementable enterprise-wide strategy for fully taking advantage of global S&T, either by absorbing knowledge and talent from the international community or collaborating, it runs the risk of losing technical competency with severe implications for economic and national security."
(NRC Committee on Globalization of S&T, 2014)

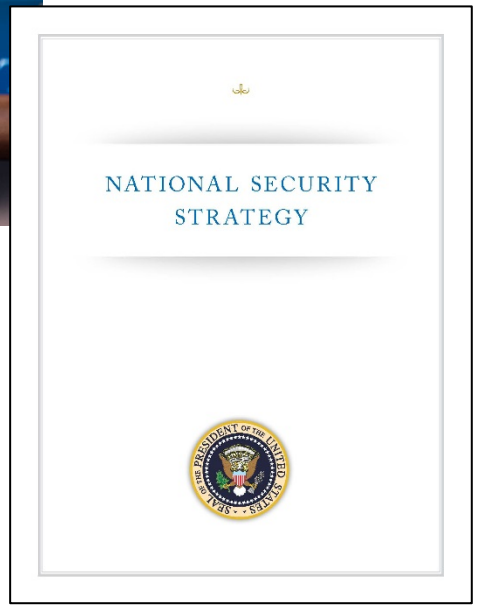
Going forward, DOD must have:

- An understanding of existing mechanisms intended to improve global S&T awareness
- A strategy to maintain global awareness
- A workforce development strategy
- Enterprise-wide solutions to implement the strategy.

Reform of the enterprise targets actions in four domains

- Improve our ability to recruit and retain the best and brightest scientists and engineers to work on difficult national security problems
  - Quality
  - Flow
  - Diversity
- Invest in, and strategically manage, 21st century facilities and technical infrastructure
  - Mission-based metrics
  - Improved processes
  - Policies that support and encourage collaboration
- Streamline rules and regulations that stifle innovation and performance
  - Best-practices governance and processes
  - Delegated responsibility with risk-tolerant accountability
- Adapt and employ best innovation practices
  - Competitive and globally-engaged
  - Thoughtful about the unique aspects of national security missions

The role of American leadership is outlined in the President's National Security Strategy



Dimensions of leadership:

- Security
- Prosperity
- Values
- International Order

Leadership …

- with purpose
- from a position of strength
- by example
- with capable partners
- with perspective

Continued partnership with Naval S&T

- Many accomplishments, people, and places to celebrate
- Strong management practices
  - 6.1-6.3 integration,
  - Deliberate portfolio management,
  - Close coordination with the Navy and Marine Corps S&T corporate board and transition-focused Technology Oversight Group
- Attention to international S&T trends and advances through ONR Global, and the Global Technology Awareness program to inform the enterprise
- Innovative Naval Prototypes program
- Leadership in the Reliance 21 Communities of Interest
- Use of lab demo and other personnel authorities by the Naval Research Laboratory to recruit and retain STEM talent.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